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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/744,008	12/24/2003	Hideki Tomoto	108179-00035	9407

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ARENT FOX KINTNER PLOTKIN & KAHN, PLLC
Suite 600
1050 Connecticut Avenue, N.W.
Washington, DC 20036-5339

EXAMINER	
SASTRI, SATYA B	
ART UNIT	**PAPER NUMBER**
1713	

DATE MAILED: 12/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/744,008	TOMOTO ET AL.	
	Examiner	Art Unit	
	Satya B. Sastri	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to application filed on December 24, 2003. ***Claims 1-11*** are now pending in the application.

Specification

2. The disclosure is objected to because of the following informalities: It is noted that the description of drawings in the specification precedes the working examples. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

3. As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.

(b) CROSS-REFERENCE TO RELATED APPLICATIONS.

(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.

(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT

(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or

REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)

(f) BACKGROUND OF THE INVENTION.

(1) Field of the Invention.

(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

(g) BRIEF SUMMARY OF THE INVENTION.

(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(i) DETAILED DESCRIPTION OF THE INVENTION.

(j) CLAIM OR CLAIMS (commencing on a separate sheet).

(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino

acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Analysis

4. In the instant claims, carbon aggregate is understood to include carbon fibers and powders.

Claim Objections

5. ***Claims 8-11*** are objected to because of the following informalities: Instant claim language is confusing and following suggestions are made by the examiner: Firstly, the claim language must specify that the spherical resin is different from the thermosetting resin. Secondly, it would be more appropriate to refer to the spherical resin as resin with spherical particles. Appropriate corrections are required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. ***Claims 1-7*** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention. Instant ***claims 1-7*** recite a sliding element comprising carbon aggregate and thermosetting resin binder and scattered pores. It is unclear if the sliding element includes the thermosetting resin and the pores simultaneously or if the pores result only after the carbonization of the resin. Based on the working examples in the disclosure, it appears as if the sliding element in essence, is a carbon-carbon composite with the recited pores resulting after carbonization and thus, the thermosetting resin as instantly claimed is not present in the article.

Claim Rejections - 35 USC § 102 and 103

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. ***Claims 1-5*** are rejected under 35 U.S.C. 102(b) as anticipated by Hiroko et al. (JP 11130876, Machine Translation).

Hiroko et al. disclose a sliding member comprising a resin composite having excellent abrasion resistance and comprising 30-70 volume % of fibrous filler made of carbon fiber or organic fiber and 70-30 volume % of thermosetting resin and uniformly arranged pores on the sliding face (abstract). Pore area ratio is interpreted as being in the range of 3-30% and the pore

pitch diameter on the sliding surface is in the range of 15-80 micrometers (page 2, paragraph 0015-0016). Since instantly claimed article has a composition that reads on the porous composite sliding member disclosed in the prior art, the composition must inherently posses the instantly claimed hardness values.

11. ***Claims 1-5*** are rejected under 35 U.S.C. 102(b) as anticipated by Watada (US 5,990,222).

The prior art to Watada et al. concerns resin-filler composite for use in structural and electronic parts. The process comprises mixing fillers with an average particle diameter of 40 micrometers or less with thermosetting resin, a step of compressing molding and heat treating the molded body (abstract). The molding composition comprises 10 to 70 volume % thermosetting resin and the balance being fillers with an average particle diameter of 40 micrometers or less (column 3, lines 9-12, column 4, lines 19-24, working examples). As fillers, powders or fibers of organic or inorganic materials may be used and carbon fibers are explicitly disclosed (column 4, lines 30-45). The porous resin composite material is used in sliding members. The composite has pores with average diameter in the range of 15 to 80 μm, and the area of the pores is preferably in the range of 3 to 30%. Since instantly claimed article has a composition that reads on the porous composite sliding member disclosed in the prior art, the composition must inherently posses the instantly claimed hardness values.

12. ***Claims 1-7*** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Demendi et al. (US 5,538,649).

Demendi et al. disclose composition for use in tribological applications such as in mechanical seals, bearings and other sliding or rubbing components (abstract). The composition comprises one compound selected from the group consisting of amorphous carbon, graphitic carbon, petroleum coke etc. in the range of 40-75% by wt., 25-50 wt.% of at least one binder. The raw material is mixed and molded in a furnace and may be further heat-treated by baking to carbonize the binder in an inert atmosphere (column 2, lines 52-59, column 3, lines 0-36). Optionally, reimpregnation and heat treatment may be repeated to reduce the permeability and assure imperviousness. The working example 4 discloses a composition within the instantly claimed range and table 1A discloses a silicon carbide mating ring wear (example 4, columns 9-10).

Even though the prior art does not teach a porous composite or pore dimension, a reasonable basis exits to believe that the molded structure is inherently porous with small isolated pores resulting from the decomposition of the organic binder resin at elevated temperatures of 800 C. Binders such as phenol-formaldehyde resins disclosed in working example 4 decompose when heated to elevated temperatures of 800 °C and thus must inherently result in a porous structure. Additionally, the process discloses allowing sufficient time to carbonize the binder and thus, a reasonable basis exists to believe that resultant pores are small in size. Evidence to the fact that the product has isolated pores is provided from the fact the product has substantially zero permeability at 10 bar air pressure (column 10, lines 17-22).

In the alternative, presently claimed property of isolated pore size in the range of 1 to 100 μm would obviously have been present once the Demendi et al. product is provided. It has been held that where applicant claims a composition in terms of function, property or characteristic

where said function is not explicitly shown by the reference and where the examiner has explained why the function, property or characteristic is considered inherent in the prior art, it is appropriate for the examiner to make a rejection under both the applicable section of 35 USC 102 and 35 USC 103 such that the burden is placed upon the applicant to provide clear evidence that the respective compositions do in fact differ. *In re Best*, 195 USPQ 430, 433 (CCPA 1977); *In re Fitzgerald et al.*, 205 USPQ 594, 596 (CCPA 1980).

13. ***Claims 6,7*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Watada (US 5,990,222) in view of Kagawa et al. (US 5,080,378).

The prior art to Watada et al. is elaborated above in paragraph 11 and is incorporated herein by reference.

The difference between the prior art and the instant invention is that the prior art does not disclose a seal assembly comprising a mating element of silicon carbide.

Secondary reference to Kagawa discloses silicon carbide sintered body for mechanical seal. The seal includes a pair of stationary sliding ring and a rotary sliding ring at least one of which is made from sintered silicon carbide. The other ring may be made of a material selected from the group consisting of carbon materials including carbon bodies and resin impregrnated carbon bodies (column 3, lines 9-17). The prior art discloses the advantage of using sintered silicon carbide in terms if providing high wear resistance and corrosion resistance (column 2, lines 50-56). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the sliding member disclosed by Watada et al. against silicon carbide mating surface and thereby obtain the instant invention.

14. ***Claims 8-11*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Demendi et al. (US 5,538,649) in view of Kagawa et al. (US 5,080,378).

The prior art to Demendi et al. is elaborated above in paragraph 12 and is incorporated herein by reference.

The difference between the prior art and the instant invention is that the prior art does not disclose the pore size or process or making porous composite using spherical beads of polymeric resin.

Prior art to Kagawa et al. discloses the use of spherical resin such as polystyrene to introduce porosity in the composition upon sintering. The pores in sliding articles are to have a diameter in the range of 10-40μm so as to effectively serve as liquid reservoirs for easily extruding impregnated therein and for maintaining the effect of the liquid reservoirs without runout in a short time and for preventing abnormal wear of the sliding ring (column 3, lines 37-43). In light of such teachings, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include include polymeric resin beads in the compositions of Demendi et al. and thereby obtain the instant invention.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satya Sastri at (571) 272 1112.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached at (571) 272 1114.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SATYA SASTRI

December 7, 2005

LING-SUI CHOI
PRIMARY EXAMINER